

ANNEX E OPERATIONAL CHARACTERISTICS SPECIFIC TO VARIOUS TERRAIN SETS

UA soldiers and leaders must be experts in the understanding and use of terrain. Some of the implications of terrain are covered in this annex. For combat development purposes, terrain can be described within three broad categories: 1) open/rolling, 2) urban, 3) other complex, consisting of dense forest, jungle, and mountains. Considerations for each of the three terrain categories are summarized below.

1.1 OPEN / ROLLING

Open and rolling terrain primarily includes the topographic characteristics of flat desert and vegetated plains. This environment provides advantages to both the enemy and Objective Force units. Military operations in open and rolling terrain include the following challenges:

- Flat terrain allows the enemy to take advantage of all sources of sensors in combination with long-range indirect and direct fire weapon systems (maximum effectiveness) to create recon-strike complexes.
- Masking for aviation assets becomes difficult and the vulnerability of attack aviation is increased.
- Cover and concealment in open and rolling terrain are limited, making protection of high value assets difficult.
- There is little natural cover from aerial attack and observation.
- Natural obstacles such as lakes, rivers, salt marshes, dry lakebeds, can force canalization in open and rolling terrain, especially in wet seasons. These natural obstacles can be reinforced with minefields, multiply the effects of recon-strike complexes.
- Key terrain is largely dependent on the restrictions to movement that are present. In very flat deserts such as Iraq, there is little key terrain.
- Avenues of approach are not very clearly defined. Open areas allow for approach from virtually every direction.

The tempo of operations in this terrain places an emphasis on speed of attack, isolation, and shielding that enable the Unit of Action to rapidly close in on the enemy from multiple directions, assault, and transition. Maneuver on multiple axes is both an operational advantage and an imperative for protection.

Target acquisition and engagement will be rapid and deadly in this environment, demanding speed, stealth, and dispersion to improve survivability. Standoff acquisition and engagement will be routine. UA

commanders and leaders will need to maximize both standoff and fires—such as suppression and obscuration.

Mobility in this terrain is less of a challenge. Open areas allow for approach from virtually any direction. FCS mobility will make this factor uniform throughout this terrain set and includes bypassing of most natural and constructed obstacles.

1.2 THE URBAN FIGHT

Even with advanced capabilities, military operations on urban terrain (MOU) will be an increasingly challenging but common feature of future operations. These factors will be even more influential in urban areas where the enemy has the benefit of tight terrain compartments and an indigenous population.

Urban terrain is characterized by several unique aspects that pose significant challenges. They include: multi-dimensional aspects of the terrain – airspace, super surface, intrasurface, surface and ground, subterranean corridor; the difficulty in identifying enemy combatants from non-combatants, including the intentional use of women and children as shields and instigators of unrest. They also include the requirement for: precision engagement of identified enemy formations without unacceptable collateral damage, fleeting targets due to short inter-visibility lines, cover and concealment, and numerous unobservable lines of communications.

The combined arms brigade and battalion must continually assess the urban terrain, infrastructure, and human dimensions before, during, and after each urban engagement. Our capabilities must include dynamic mapping, and ground and wall penetrating sensors.

Decisive urban operations are focused on key urban terrain locations and on enemy forces and capabilities. Units of Action will likely have to approach from multiple directions, including vertical, both mounted and dismounted maneuver elements swiftly engage and overwhelm enemy forces in both independent and interdependent actions.ⁱ

Close assault is a central aspect of urban engagements, both due to the nature of the terrain and enemy as well as the need to minimize collateral damage and preserve critical infrastructure. Small unit effectiveness and empowered leadership are critical to the success of these operations. Close urban assault has a significant dismounted character, requiring a robust infantry capability to engage and sustain the urban fight. Dismounted teams and squads will be enabled by FCS systems. These units will exploit hand-held and unmanned ISR tools and the common operational picture (COP).ⁱⁱ

Target acquisition and engagement is difficult in the close confines of the urban environment. Fleeting targets can be acquired and killed using the battalion's ISR capabilities and advanced weapons systems.

1.3 THE COMPLEX TERRAIN FIGHT

Complex terrain is characterized by steep and heavily dissected terrain containing steep slopes with sudden elevation changes, circuitous gaps and passes with a large number of severe slope variations. Challenges include:

- Cover and concealment in complex terrain will make it difficult to find and kill the enemy.
- Vegetation and terrain limits the effectiveness of many recon assets as well as stand-off, area, and non-lethal weapons.
- Natural obstacles severely restrict movement and hinder synchronization.
- Terrain canalizes and isolates forces. Defiles and choke points can enhance enemy defenses and present a high risk to operations. Roads become critical assets that can be disrupted by man-made obstacles and minefields.
- Mountain passes become key for lines of communication (LOC).
- Security is a challenge. The nature of the vegetation and terrain increases the chance of surprise contact with the enemy.
- Protection from the severe climatic conditions that impact soldiers and equipment in these environments is difficult. Disease and heat and high water consumption are factors. In mountainous terrain, altitude sickness, cold temperatures, significant temperature variations and physical fatigue become factors.
- Poor weather multiplies the physical and terrain effects of the complex environment considerably.
- UA must have dynamic mapping, ground and foliage penetrating sensors, and unmanned autonomous (principally aerial) sensors.

Diverse terrain and vegetation, including austere to non-existent infrastructure, challenges UA mobility and agility. Critical to mobility is aviation lift support from the Unit of Employment that enables the unit to bypass choke points and achieve positional advantage against identified enemy forces. In less challenging, but still complex terrain sets, FCS levels of mobility—present throughout the entire unit will enable it to traverse terrain the enemy disregards as impassible.

UA commanders must use lethal and nonlethal munitions precisely on enemy formations and systems, destroying or suppressing them depending on proximity to civilian population resupply centers or sites of historical significance.

Attack aviation and guided munitions may be the most agile and reliable means of engaging enemy positions. BLOS, cued by overhead sensors and pattern analysis tools will mitigate the challenge of fleeting targets and short engagement ranges.

ⁱ SoRC: A-5, C-14

ⁱⁱ SoRC: C-5, C-14